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HOG CHOLERA

number **1** *killer*

Agricultural Research Service
U.S. DEPARTMENT OF AGRICULTURE

This pamphlet on the hog cholera eradication program is designed as a reference or guide for agricultural leaders.

Its purpose is to furnish you with background information on both the disease and the eradication program. It is hoped that you will find the information helpful in answering questions which hog producers may ask; in informing farmers about the eradication program; and as a reference in preparing news releases. Vocational Agriculture instructors may also use it as a teaching aid.

Additional information may be obtained by writing: Animal Disease Eradication Division, Agricultural Research Service, U.S. Department of Agriculture, Federal Center Building, Hyattsville, Md., 20781.

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HOG CHOLERA

number 1 killer

Hog cholera kills more swine past weaning age than any other single disease.

It is an infectious, highly contagious virus disease which affects swine only. It's nearly always fatal--very few hogs ever recover.

A few hogs are naturally immune. But from a practical viewpoint, all hogs in the United States that have not been immunized against cholera are susceptible.

Swine with hog cholera are "sick all over." They lie around, have high fevers, and are extremely weak. They may have eye discharges. Sick hogs go off feed, stagger, and often stand in a "thinking" attitude--motionless, tail relaxed, ears hanging limp, and the head slightly lowered as if in deep thought.

A hog starts shedding virus--and thus exposing other hogs--about 3 days after he has contracted hog cholera. Visible symptoms of cholera appear from 4 to 7 days after infection. Death usually occurs within 4 to 10 days after the first signs appear--within 8 to 17 days after infection.

How the Disease Spreads . . .

Susceptible hogs get cholera by direct contact with infected hogs or with contaminated premises, vehicles,



These three pictures
illustrate a common symptom of
hog cholera--loss of
coordination, especially in the
hindquarters.
This is most easily seen
soon after a pig
has been made to rise
and walk.

stockyards, and sales barns. One of the chief reservoirs of the virus is the infected hog. This animal is, in effect, a virus "factory."

Therefore, shipment of infected or exposed swine is one of the primary ways hog cholera spreads.

Man, himself, is guilty of contributing to the spread of hog cholera. Contaminated vehicles and clothing--dirty boots, for instance--provide a ready means of transportation for this deadly virus.

Uncooked garbage that contains pork trimmings from infected hogs is a common source of cholera.

Carcasses of hogs killed by cholera can spread the disease--as can birds or animals that feed on these carcasses.

Drainage from cholera-infected farms can carry the virus.

History of Cholera . . .

Apparently, hog cholera is a truly American animal disease. It was first recognized in southern Ohio in 1833. From this beginning, it was reported in South Carolina in 1837; in Georgia the following year; and in Alabama, Florida, Illinois, and Indiana in 1840. After 1845, hog cholera spread at an alarming rate. By 1880, the annual loss from hog cholera was estimated at \$10 to \$25 million.

The most serious epidemics of cholera occurred in 1887, 1896, 1913, and 1926. More recent outbreaks took place in 1949 and 1950. During each of these epidemics, hog producers suffered enormous losses--in some localities the swine population was almost wiped out. According to records, the disease killed more than 13 percent of the

swine in the country in 1896; in 1913, more than 10 percent of the hogs in the United States died of hog cholera.

The cause of cholera was not demonstrated until 1903. Within 5 years USDA scientists had developed an anti-hog-cholera serum that would protect hogs from cholera and that could be used simultaneously with the virus itself to produce a long-lasting immunity.

However, as years passed, many individuals associated with this type of immunization recognized the danger in using virulent virus. Hogs receiving virulent virus continued to shed the virus and could infect susceptible hogs for up to 30 days following vaccination. Consequently, there was a determined search for a vaccine that would remove this danger.

In the mid-thirties, inactivated virus vaccines were developed. Since the virus is inactivated, these vaccines are perfectly safe to use--they won't spread the disease. These vaccines cannot be used with serum, and thus, they don't confer immediate protection; it takes about 3 weeks before they give effective protection against hog cholera.

So the search went on--looking for a vaccine that would give quick protection, yet remove the danger of introducing the disease that was associated with the use of virulent virus. This goal was achieved in the late 1940's with the development of attenuated or modified live virus vaccines. These vaccines are prepared by passing the fully virulent virus through a different animal host--such as the rabbit--until the virus is "altered" to take away its full virulence or killing power. In other words, the disease-producing ability of the virus is greatly reduced or removed.

Most modified live virus vaccines are recommended for simultaneous use with serum (or antibody concentrate). Some may be used either with or without serum. However,

the recommended procedure is to use serum (or antibody concentrate) with all modified live virus vaccines to produce both instant and lasting protection.

The advantages of this method of vaccination were readily apparent to the livestock industry. Use of virulent virus has steadily declined since the modified virus vaccines were put into use. In 1950, virulent virus accounted for over 90 percent of all hog cholera biologics produced. By 1955, the percentage was 32; by 1958, 11 percent; and by 1961, only 5 percent was virulent virus, and much of this was shipped overseas. The percentage of hogs vaccinated with inactivated virus vaccines has remained rather constant at the 6-percent level.

Alabama, in 1954, was the first State to outlaw virulent virus for general field use. Other States have followed suit, with most of them now prohibiting or restricting its use. In addition, Federal regulations prohibit the interstate shipment of virulent virus for general use. Also, hogs vaccinated with virulent hog cholera virus cannot be shipped interstate except for research and testing of vaccines.

The Cost of Living with Hog Cholera . . .

Hog cholera is expensive--both on a national and individual basis. In 1962 hog cholera cost U.S. swine producers over \$50 million. It cost that much the year before and the year before that. And it can be expected that this yearly cost will continue until the disease is no longer merely controlled, but eradicated.

Individual costs are even more striking. Over the past half century, "living" with hog cholera has cost the average producer about 45 cents for each pig he has marketed.

Contrast this 45-cent-per-pig figure with the cost in Canada--where hog cholera has been eradicated for nearly a half century. There, the cost of hog cholera eradication over the years has been estimated at a penny per pig marketed--this cost due mainly to indemnities paid in "stamping out" isolated outbreaks.

Living with hog cholera is expensive. The veterinary bill on one large Iowa hog producer's farm in 1959 was \$1,710. Almost \$1,400 of this was for hog cholera vaccination. This same producer estimated that his "insurance" against hog cholera had cost him \$20,000 over a 20-year period. When cholera is eradicated, this cost will be eliminated--vaccination won't be necessary because there will be no danger of exposure.

Eradication of hog cholera could also increase pork exports. Eleven countries now bar U.S. pork because of cholera. When hog cholera is eradicated, U.S. producers will be able to compete for a potential export market of over 60 million pounds of pork annually--worth some \$15.3 million.

Why Eradication Now?

For many years hog producers continued to "live with hog cholera"--primarily because they had no other choice. But today, the means to eradicate this disease are available. So now there is a choice: Continue to live with cholera--or eradicate it.

Several factors have made this choice possible. Improved vaccines give good protection against cholera; properly used, these vaccines are both safe and effective. A nationwide system of garbage cooking is now in effect--something which wasn't around 10 years ago. And finally, the aroused support of swine industry makes eradication a realistic goal.

The U.S. Department of Agriculture policy on animal diseases and pests can be summed up as:

- Where possible keep them out.
- If they become established, eradicate them.
- If eradication is presently impossible, control them.

In case of hog cholera, the goal is:

- Eradication.

Eradication of livestock diseases and pests is not a theory--it can be done. This was first proved with the elimination of contagious pleuropneumonia some 70 years ago. Both the United States and Canada have demonstrated this principle with foot-and-mouth disease. This dread livestock disease has invaded the United States six times since 1900. Each time it has been wiped out by rigorous measures--quarantine, slaughter, payment of indemnities, and disinfection.

The eradication of vesicular exanthema (VE) took 7 years of intensive effort--but it was worth it. At the height of the VE outbreak, the disease was found in 42 States. But time-tried eradication measures--together with the cooking of garbage--made it possible to eradicate VE.

How do we decide whether to eradicate a disease or control it? This depends largely on the disease and what is known about it. We must have the "know-how" to combat a disease before we can attempt to eradicate it.

In practice, no eradication campaign can succeed without the wholehearted support of livestock owners and of the livestock industry. A disease can be eradicated only when all concerned become convinced that it is easier and more economical to eradicate than merely to control.

That time has come for hog cholera.

The Cooperative State-Federal Hog Cholera Eradication Program . . .

In September 1961, Congress passed a law authorizing the U.S. Department of Agriculture to undertake a broad State-Federal effort to eradicate hog cholera from the United States. The Animal Disease Eradication Division of USDA's Agricultural Research Service administers the Federal program in cooperation with the States.

The law authorized the Secretary of Agriculture to establish a 12-member advisory committee--representing the swine industry, consumer groups, State and local governments, and professional and scientific organizations--to help develop plans for an eradication program. Chairman of the National Hog Cholera Advisory Committee--as provided by law--is an ARS official, Dr. R. J. Anderson, deputy administrator for regulatory programs.

In general, State participation involves enforcement of State laws or regulations pertaining to reporting the disease, quarantining infected and exposed premises, and inspecting premises. USDA enforces interstate laws and regulations, cooperates in inspections, assists in diagnostic work, trains specialists in eradication techniques, and shares the costs of surveys and traceback inspections necessary to determine the origin of outbreaks.

Basis of the Program

The "Nine Points for Hog Cholera Eradication" form the basis of the hog cholera eradication program. These nine points have been endorsed by the Secretary of Agriculture's National Hog Cholera Advisory Committee as the heart of the hog cholera eradication campaign. The "Nine Points" were developed by the U.S. Livestock Sanitary Association; then adopted and advanced by Livestock Conservation, Inc.

They have also received the full support of various other organizations interested in eradicating hog cholera.

Here are the "Nine Points for Hog Cholera Eradication":

- Vaccinate
- Follow shipping rules

- Report outbreaks
- Observe quarantines
- Dispose of affected hogs safely
- Clean and disinfect

- Cook garbage
- Outlaw virulent virus
- Learn the facts about hog cholera

(An explanation of each of the "Nine Points" begins on page 15.)

Individual details of the program in the various States must be worked out at the local level. The eradication measures used, however, will be based on the principles contained in the "Nine Points."

Variations in program operation from State to State are necessary because procedures that may apply, for instance, in heavy hog-producing areas of the Cornbelt may not work in range States where swine production is limited. Thus, State and local hog cholera committees, in conjunction with State and Federal animal disease control officials, must develop the eradication procedures that will best fit their situation. With this in mind, USDA has worked up a framework within which cooperative programs can be developed with the various States.



The most common symptom of hog cholera

How the Program Works

A four-phase program which spells out how the U.S. Department of Agriculture will participate with a State in a cooperative hog cholera eradication program has been adopted. The program establishes minimum standards for instituting and carrying out a cooperative hog cholera eradication campaign.

However, a campaign within any State is conducted under authority of State laws. In some cases, States will need to enact new laws or amend existing legislation in order to start a cooperative eradication program. Prior to the beginning of a cooperative program, a State should have authority to:

- (1) Require the prompt reporting of hog cholera.
- (2) Establish and enforce quarantines (including quarantine on suspicion of hog cholera).



3: Pigs that are just "sick all over"

- (3) Regulate intrastate shipment of swine.
- (4) Require cooking of garbage fed to swine.
- (5) Perform necessary inspections.
- (6) Require proper disposal of carcasses and infected and exposed animals.
- (7) Require necessary cleaning and disinfection.
- (8) Control the type and administration of hog cholera biologics.

When these authorities are present, a State is ready to enter the first of the four phases of the cooperative program. These four phases are: (1) preparation, (2) reduction of incidence of hog cholera, (3) elimination of outbreaks, and (4) protection against reinfection.



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Each of these phases represents a gradual buildup in a State's fight against hog cholera, leading ultimately to the elimination of the disease.

Phase I--Preparation. This first phase involves getting the cooperative program organized and under way by: (1) establishing State and, if necessary, local hog cholera committees; (2) distributing information on the disease and the eradication program; (3) developing a system for immediate reporting--such as by telephone--of all outbreaks; (4) arranging for prompt and complete investigations of outbreaks to find their source and thus help prevent further spread; and (5) re-emphasizing garbage cooking and inspection.

Phase II--Reduction of Incidence. In order to enter the second phase of the program, a State must have all of the steps outlined above in operation. The purpose during this phase is to reduce the incidence of hog cholera by continuing all measures developed in Phase I and by instituting the following steps if they are not already in effect: (1) Quarantines for infected and exposed herds; (2) proper disposal of infected animals; and (3) regulations on shipments of swine within a State to help prevent pigs that move from markets back to farms from spreading hog cholera. The latter step would include inspection of pigs at markets, with vaccination if it is necessary as a part of the cooperative program in that State.

Phase III--Elimination of Outbreaks. The primary goal here is to promptly eliminate those few infected and exposed herds that remain to threaten the eradication program. This is the active eradication phase of the program--the first phase in which cooperative State-Federal indemnities are available as an added tool to help wipe out the last remnants of hog cholera.

Federal participation in cooperative indemnity payments is intended only for the final stages of the program, after incidence of the disease has been reduced to a low level, and when indemnities will provide an efficient way to get rid of the remaining pockets of infection.

To enter Phase III, State and Federal veterinary officials in the State involved develop detailed plans for disposal of infected and exposed hogs, with provisions for indemnities if they are to be used. Also, they develop plans for (1) inspecting exposed swine in a cholera outbreak; and (2) cleaning and disinfecting infected premises under immediate supervision of regulatory personnel.

Phase IV--Protection Against Reinfection. This final phase of the program is for those States which apparently have no hog cholera. If an outbreak should occur, it would be handled on an emergency basis--the entire herd would be disposed of immediately, with indemnity payments.

If a State remains uninfected for at least a year--and meets certain other requirements--it can be officially declared "Hog Cholera Free." Standards defining this have been adopted by the U.S. Livestock Sanitary Association and have been approved by USDA. It means complete freedom from the disease, plus carrying out the necessary measures to prevent reinfection from other areas.

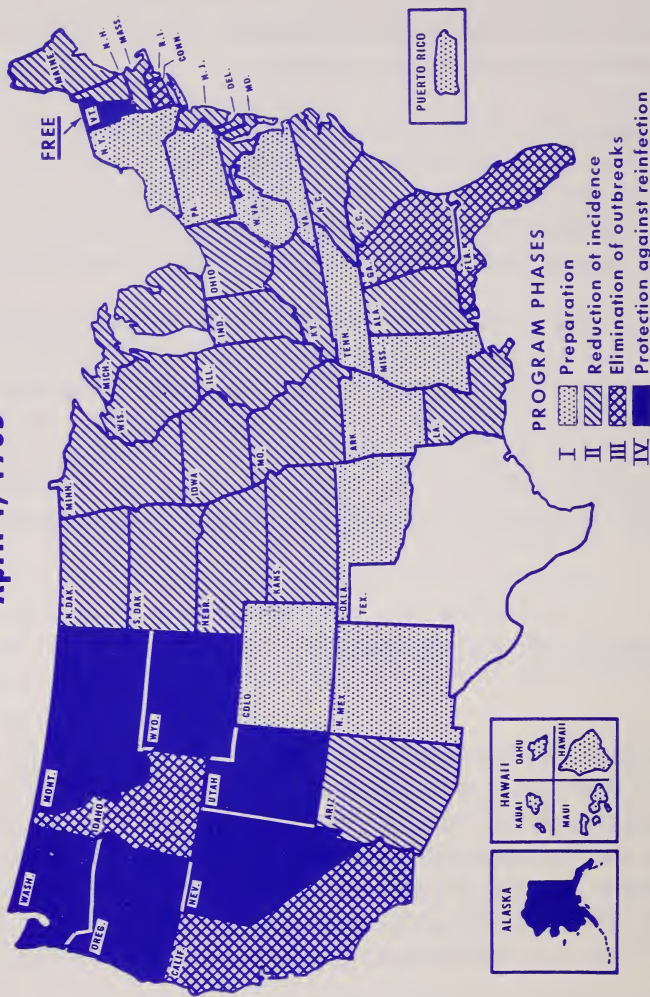
Goals for Eradication

Goals of "practical" eradication of hog cholera by the end of 1969 with official declaration of the nation as "Hog Cholera Free" in 1972 were established in February 1964 by the National Hog Cholera Committee of Livestock Conservation, Inc. In June 1964 these same goals were endorsed by the Secretary of Agriculture's National Hog Cholera Advisory Committee as "realistic and attainable."

Intermediate goals are as follows: All States in Phase I of the four-phase eradication program by the end of 1964; all States in Phase II or higher by the end of 1965; and all States in Phase III or IV by the end of 1967.

Hog Cholera Eradication Program

April 1, 1965



What Eradication Will Mean . . .

Many people are inclined to confuse eradication with control. This is understandable in the case of hog cholera, since this country has a long history of living with the disease. Control means keeping a disease in check--in short, "living with it." In contrast, eradication means complete elimination of the virus or disease-causing organism until there is no more known infection in this country.

What will this mean to the producer? Perhaps most important, it will mean an end to the expensive and time-consuming chore of vaccinating for hog cholera. Once cholera is eradicated, there will be no need to vaccinate. Canada, which has eradicated cholera, discontinued its vaccination program many years ago.

Dr. B. T. Simms, former Chief of the Bureau of Animal Industry, once said, "Disease eradication is a state of mind. Once the livestock industry makes up its mind to get rid of a disease, nothing will stand in its way."

The "Nine Points" in Detail . . .

- Vaccinate. A high level of vaccination is one of the prerequisites to a successful hog cholera eradication program. In 1961, only about 45 percent of the hogs in this country were immunized against hog cholera. About 50 million hogs were not vaccinated.

Hog cholera can't be eradicated by vaccination alone. But increased vaccination helps keep the disease at a low level so that other eradication procedures can be applied more readily.

Vaccination is particularly important in areas where outbreaks occur year after year. Pigs should be vaccinated

with (1) modified live virus vaccine and anti-hog-cholera serum (or antibody concentrate), or (2) inactivated virus vaccine. Properly used, either of these methods of vaccination will provide safe, effective protection against cholera.

Proper vaccination is extremely important to assure immunity of pigs. Selection of the product to be used, understanding correct methods of handling and administering the vaccine, and the health status of the pigs are all vital in getting good results.

Pigs that have just been weaned, castrated, or treated for worms are not entirely "healthy." So it's best to carry out these operations at least 1 week before or 2 weeks after vaccination.

The best time to vaccinate pigs is about 2 weeks after weaning. Pigs vaccinated at earlier ages may still have some acquired immunity gained from suckling immune sows and therefore the vaccination may not "take." Delaying vaccination more than 2 weeks after weaning only serves to increase vaccination costs. Also, delay leaves that much more chance for infection.

Use good husbandry and feeding practices with no drastic changes immediately before or after vaccination. Avoid heavy feeding. Keep hogs in sanitary areas both before and after vaccination.

Pregnant sows should not be vaccinated with modified live virus vaccines. Inactivated virus vaccines, however, can be used during any stage of pregnancy. The inactivated virus vaccines can also be safely used on unthrifty pigs, if vaccination is necessary.

Most modified live virus vaccines are specified by the licensed manufacturer for simultaneous use with serum. A few modified live virus vaccines may be used either



Dependable hog cholera vaccines produced under USDA license and inspection provide effective protection against the disease.

with or without serum. However, it's recommended that serum be used with all modified live virus vaccines to give immediate protection against cholera.

Also, feeder pigs or breeding swine that are to be shipped interstate within 21 days of on-farm vaccination must receive serum and modified live virus vaccine simultaneously in order to comply with Federal regulations on interstate shipment of swine. Such vaccination--as well as any hog cholera vaccination for interstate shipment--must be official. That is, the pigs must be vaccinated, permanently identified, and reported as official vaccinates by an accredited veterinarian.

- Follow shipping rules. Unless everyone follows the rules for shipping hogs, hog cholera will be difficult to eradicate.

Shipment of infected and exposed hogs is one of the primary ways hog cholera spreads.

Here, in brief, is a good rule to follow when shipping hogs: If someone sells feeder pigs or breeding stock, he should furnish the buyer with (1) vaccination records, (2) a health certificate, and (3) clean transportation. If he buys these classes of hogs, he should ask the seller for this material.

Rules for shipping hogs within a State may, of course, vary from the interstate regulations. Every hog producer should familiarize himself with the regulations in his own State, in States where he sells hogs, and with the Federal interstate regulations.

- Report outbreaks. If a farmer suspects hog cholera in his herd, he should report it immediately to his veterinarian, his county agent, or to State or Federal animal disease control officials.

Most States presently have laws requiring hog cholera outbreaks to be reported to the proper officials. Under a full-scale eradication program, of course, mandatory reporting will be necessary in all States.

Prompt reporting--such as by telephone--of all outbreaks is essential in order to handle the infected herd most effectively. This is also vital in tracing the origin of the infection. The longer the source of the outbreak is unknown, the greater the chance of further spread of infection.

Prompt and accurate reporting also serves another purpose--it pinpoints progress in eradication work. If it is not known where--or how many--outbreaks occur, there is no way of judging the effectiveness of eradication measures.

- Observe quarantines. Hogs infected with or exposed to cholera are the most important means of spreading the disease. Hog producers should be encouraged to respect quarantines--both for the safety of their own herd, as well as for that of their neighbors. If their herd is infected, they should let their neighbors know. Visitors should be kept out of infected and exposed quarters.

And, above all, no hogs should be sold from quarantined farms, except under permit. It has been common practice in some areas to attempt to reduce financial losses by shipping exposed--but apparently healthy--hogs quickly to market. Such shipments provide an easy means for the spread of the disease. Also, the meat from these animals will contain hog cholera virus and will be widely distributed.

- Dispose of affected hogs safely. Safe, prompt disposal of hogs dead or dying of the disease is essential to eradication. Carcasses of hogs that have died of cholera can spread the disease--as can crows or dogs or other animals that may feed on the carcasses.

Carcasses should be destroyed by burning or burying. Or they may be rendered under proper supervision. Exposed animals not yet sick should be kept in strict quarantine.

State and Federal veterinary officials can supply exact information as to the proper disposal of affected hogs.

- Clean and disinfect. Buildings, lots, and vehicles contaminated by infected or exposed hogs should be thoroughly cleaned and disinfected.

Here, the key word is cleaning. Thorough cleaning is 80 percent of the job. Walls and floors, for instance, should be scraped clean of all manure, straw, or other refuse and then thoroughly scrubbed and rinsed. Trucks or railroad cars that have hauled infected or exposed hogs should be treated in the same manner.

Instructions on which disinfectants are effective and how they should be used can be obtained from State and Federal veterinary officials.

- Cook garbage. Cook all garbage fed to hogs. Raw pork in table scraps or garbage can contain lethal hog cholera virus. Also, the virus can live for some time in some forms of processed pork, such as ham, bacon, or salt pork.

However, cooking the garbage--by holding it at boiling temperatures for 30 minutes--will destroy any hog cholera virus that may be present. All States now have requirements that garbage fed to hogs must be cooked. In addition, Federal regulations prohibit the interstate shipment of raw garbage-fed swine, except for special processing.

- Outlaw Virulent virus. It has long been recognized that hog cholera could not be eradicated as long as the use of fully virulent virus was permitted. Federal regulations

now forbid the interstate shipment of virulent virus for general use, as well as the interstate shipment of hogs vaccinated with it (except for research and testing of vaccines).

- Learn the facts about hog cholera. When producers know the facts, they will cooperate with any reasonable and down-to-earth eradication program--especially if they realize that this is the best means known for cutting their production costs. The more hog producers know about the disease, how it spreads, and the modern weapons used against it, the better equipped they'll be to fight it.

Information Support . . .

The keys to the success of the hog cholera eradication campaign are education and organization. Education comes first.

Before an eradication campaign begins in any area, the people affected should know (1) the nature of the disease and its economic importance, (2) what the objectives of the eradication program are, (3) how eradication can help them and their community, (4) procedures to be followed under the eradication program, and (5) how and when they can participate.

Information covering the first three points can be prepared on both the National and State level. Much of the information on the final two points is usually prepared on the State and local level, since details of the program vary in different States and localities.

When the program is ready to start in a county or other local area, full information should be made available about the "when, where, and how" of each eradication measure. Agricultural leaders must bear much of the responsibility for getting this information out to farmers.

Each facet of the industry must understand its responsibilities relating to the reporting of the disease, quarantines, shipping rules, vaccination, and all other aspects of the eradication program.

Individual hog producers in particular must develop an awareness of their own responsibilities. Success of the eradication program can be assured only if all producers follow the "golden rule" for hog cholera prevention: "Protect yourself as you would have your neighbor protect you."

A number of information pieces dealing with hog cholera have been--and will be--prepared. State and local hog cholera committees, the State Extension Service, producer organizations, and other interested groups can aid in the distribution of this material.

Here is a list of information pieces that are available from Federal sources.

PA 577, What you should know about Hog Cholera. This gives a brief description of the disease, how it's caused, how it's spread, and how it may be prevented through good sanitation and proper vaccination.

PA 628, Questions and answers about Eradicating Hog Cholera. This explains in question and answer form, how the cooperative hog cholera eradication program works, the role of indemnities, and what farmers can do to aid the eradication effort.

PA-649, A Guide to Interstate Shipping Rules to Prevent the Spread of Hog Cholera. This is a digest of the Federal regulations governing interstate shipment of swine with respect to hog cholera.

Slide Series: General. A set of 39 slides with narration explains the cost of the disease to farmers, how the virus spreads, how vaccines protect pigs, and the "Nine Points." It is designed to be shown at meetings on hog cholera.

Interstate Shipping Rules. A set of 20 slides with narration has been prepared to explain the interstate shipping rules for swine. These slides are designed for use at meetings on the transportation and marketing of swine. Sets are available on loan from ADE offices and from Public Stockyards.

Poster on Proper Vaccination. An 8- by 18-inch poster emphasizing the importance of proper vaccination is designed primarily for use in livestock markets.

Tabletop Exhibit. This is a highly portable visual designed for use at local meetings. The exhibit may be obtained on loan through ADE offices in each State.

Motion Pictures. "Stamp Out Hog Cholera," a 22-minute color movie about hog cholera, how it can affect swine production, and how farmers can unite to help eradicate the disease, is available for showing at meetings. In addition, a technical color movie on the diagnosis of hog cholera has been prepared. This movie is designed primarily for showing to veterinary groups.

Annual Progress Report. Late in February each year, a report is published on the progress and problems in the cooperative State-Federal hog cholera eradication program during the past calendar year. This report summarizes information on the national level and reviews the situation in each individual State.

Quarterly Maps. On January 1, April 1, July 1, and October 1, maps showing the current status of the four-phase hog cholera eradication program are printed and distributed to regulatory workers and others involved in the hog cholera eradication program.

Some of the items listed above are available through the Extension Service. The State Veterinarian or the Federal Veterinarian-in-Charge in each State can arrange for orders of the material. They will also know of additional material to be available at later dates.

